Human Factors Working Group
Crew Resource Management and Spatial Orientation Conference

Definition of Spatial Disorientation

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Purpose

- Reach multi-service agreement on the basic definition of spatial disorientation (SD) for accident reporting documentation.
- Further define the meaning of SD to include the three reported types of SD
  - Type I (unrecognized)
  - Type II (recognized)
  - Type III (incapacitating)

Participants

- CAPT Nicholas Webster, NAVSAFECEN
- Col Kevin O'Toole, USAF Safety Center
- Col Peter B. Mapes, AFRL/HE
- Lt Col Joe McKeon, US Army Safety Center
- Lt Col Don White HQ USAF/SE
- Maj Mark Beauchemin, USAF/AIS
- Maj Tony Wurmstein, USAF Safety Center
- Capt Daniel Gibson, AFRL/HECI
- Bob Brooks, US Army SAFCEN
- Tony Carvalhais, USCG HQ Safety Div
- Bill Ercoline, GD AIS (AFRL/HECI)

Summary of Activity Day 1

- Met and discussed a variety of SD related issues
  - Historical background of SD
  - Various definitions currently in use
  - Different acronyms
  - Definitional differences across services
- Collected preferred definitions from participants
- Confusion found between cognitive awareness issues and pure physiological issues as they relate to the traditional definition of SD
- Agreed to use the SD acronym in place of SDO

Summary of Activity Day 2

- Discussed differences as written from each service and each individual
- Agreed to accept the Benson, 1978 definition of SD as the basic definition
- Some discussion about defining loss of situation awareness (LSA) but deferred until more specific expertise could be assembled
- Worked to define the three types of SD
- Completed both a basic definition of SD and then the specific words to define the three types of SD (see next slide)

Agreed SD Definition With The Definition Of Each Type

- SD Definition: A failure to sense correctly a position, motion, or attitude of the aircraft or of oneself within the fixed coordinate system provided by the surface of the earth and the gravitational vertical.
  - Type I (Unrecognized): A factor when a person's cognitive awareness of one or more of the following varies from reality:
    - Attitude
    - Position
    - Velocity
    - Direction of motion
    - Acceleration

  Proper control inputs are not made because the need is unknown.
  - Type II (Recognized): A factor when recognized perceptual confusion is induced through one or more of the following senses:
    - Visual
    - Vestibular
    - Auditory
    - Tactile
    - Proprioception
    - Kinesthetic

  Proper control inputs are still possible.
  - Type III (Incapacitating): A factor when an individual is unable to make proper control inputs for safe operation of the aircraft or system due to a conflict (often extreme) between the sensory systems identified in Type II.

Overall Summary

- Agreed to standardize and use the acronym SD
- Agreed to standardize and use the definition of SD and the Types as written in the previous slide
- Agreed to co-author a paper for formal presentation at the next AsMA annual convention to explain the outcome of this meeting
- CAPT Webster took the action to present the findings of this group to the senior safety center management of all four service organizations, i.e., US Army, US Navy, US Air Force, US Coast Guard, at the JSSC meeting now taking place
- All “agreed” items were unanimously accepted by participants